REMARKS

Claims 1-8, 12 and 13 are presently pending in the application.

Claim 1 has been amended to incorporate portions of claims 13 and 14 which have been cancelled and to make clear the types of panels which are being curved by the method of the presently claimed invention, namely planar, thermo-insulating vacuum panels having an envelope comprising a barrier sheet and the envelope containing at least one porous or discontinuous filler selected from the group consisting of inorganic powders and porous organic foams. Claim 13 has been amended to specify a preferred embodiment of the panels in which the barrier sheet is a multilayer sheet comprising at least one metal layer. These amendments are supported by the previous claims and by the specification, for example at paragraphs [0005] and [0006]. Accordingly, no new matter has been added and entry of the amendments is respectfully requested.

The Examiner has rejected all of the claims under 35 U.S.C. § 103(a) as being unpatentable over the combination of U.S. Patent 5,107,649 of Benson et al. ("Benson") in view of U.S. Patent 6,339,946 of Yamashita et al. ("Yamashita"), together with one or more additional references, including Applicant's own admission in paragraph [0005] of the specification, for certain dependent claims, for substantially the same reasons as in the previous Office Action. In addition, in response to Applicant's previous arguments, the Examiner argues in paragraph 7 at pages 7 and 8 of the Office Action (1) that Yamashita teaches that the load on the bending rolls can be adjusted as well as the spacing between the rolls (abstract), so that it would be (have been) a matter of routine experimentation to adjust the spacing and load to adapt Yamashita's bending method to accommodate a more delicate sheet such as that taught by Benson, and (2) that Benson teaches a plurality of vacuum sheets can be stacked or laminated together, combined with foam insulation material or powder insulation and subsequently easily formed around curves or used in any desired shape (column 8), so that it is clear that Benson did foresee and teach the effects of bending a panel having powder or polymeric foam as the filling material are negligible.

These rejections are again respectfully but strenuously traversed for the reasons set forth in Applicant's prior Amendment and for the additional reasons set forth in detail below, which amplify the prior Remarks and specifically address the Examiner's additional arguments above.

Essentially, it is the Examiner's position that the thermo-insulating vacuum panels to which the presently claimed invention is directed are known in the art (from Benson and/or from Applicant's admissions in the specification) and that a calendering operation for curving metal sheet materials is also known in the art (from Yamashita). The Examiner concludes that it would have been obvious to use the calendering operation of Yamashita to curve the thermo-insulating panels of Benson or Applicant's admitted prior art panels. However, this simplistic form of rejection violates the basic criteria to establish a *prima facie* case of obviousness.

In particular, MPEP § 2142 requires three basic criteria for establishing a *prima facie* case of obviousness, namely a suggestion or motivation to modify the reference or to combine reference teachings, a reasonable expectation of success of the prior art references when combined, and that the combination should teach or suggest all of the claimed limitations. The teachings or suggestions and the reasonable expectation of success should both be found in the prior art and not be based on Applicant's disclosure.

In the present case, the combination proposed by the Examiner is not suggested or taught by either Yamashita on the one hand or Benson on the other hand, with or without Applicant's admitted prior art, but instead is based upon hindsight using the Applicant's disclosed invention. Moreover, Yamashita actually teaches away from use of his calendering operation on panels such as those of Benson or the admitted prior art.

In particular, Yamashita is directed to a pipe forming apparatus and method which is disclosed to be suitable for production of high strength, thick-walled pipes, with the lowest thickness of the sheet material to be rolled being 20mm (see column 1, lines 15-17 and column 6, lines 17-20). In contrast, Benson deals with panels having a total thickness of 2.5mm (about 10 times less than Yamashita) with metal sheets forming the panel walls being 0.2-0.3mm thick (column 11, lines 50-60), i.e., about 100 times less than those in Yamashita. Aside from the fact that Yamashita and Benson are directed to completely different technical fields, one skilled in the art would never have thought of applying the calendering operation of Yamashita to a panel according to Benson, in view of the sheer magnitude of the difference in panel or sheet thickness.

Further, one skilled in the art would have had no expectation of success in using the teachings of Yamashita to curve the panels of Benson. Thus, Yamashita teaches that for a successful metal bending process for pipe forming, a strong pressing action is required by application of forces on the order of hundreds of tons (e.g., 200-800 ton f in Fig. 6). The forces

to be applied to the rolls (considering one ton f $\approx$ 8.9 X 10^3 Newton) should be of the order of about $10^5 - 10^6$ Newton. In contrast, Benson discloses rigid panels with fillers made of glass or ceramic spacers (beads), i.e., a fragile material, to hold the walls apart. Such spacers would be broken under the forces of Yamashita, thus bringing the panel walls together, certainly an unsuccessful outcome of a possible combination of the teachings of Yamashita with the panels of Benson. Contrary to the Examiner's contention, it would certainly not be a matter of "routine experimentation" to reduce the pressures and forces of pressing rolls from hundreds of tons to a few pounds or tens of pounds to curve the fragile insulation panels.

Furthermore, the Examiner's contentions in the paragraph bridging paragraphs 7 and 8 of the Office Action is inconsistent and factually incorrect. Thus, while the Examiner contends that Benson teaches a plurality of vacuum sheets stacked or laminated together and combined with foam insulation material or powder insulation, which can be easily formed around curves or used in any desired shape, a careful reading of this portion of column 8 and Fig. 15 of Benson shows that this disclosure of Benson has nothing whatsoever to do with the presently claimed invention. Thus, the foam insulation material or powder insulation 82 of Benson is outside of the vacuum panels 10, as clearly shown in Fig. 15. This teaching has no bearing or relevance to the formation of a planar vacuum panel in which an inorganic powder and/or porous organic foam is placed in an envelope comprising a barrier sheet and then evacuated to form a planar vacuum panel which is subsequently curved in a calendering operation.

That is, since the foam insulation or powder insulation material 82 of Benson is outside the evacuated panels, this teaching of Benson has no relevance and provides no foreseeability as to what might happen with an inorganic powder or organic foam which is contained in a barrier envelope and then subjected to vacuum. There is no teaching in Benson of how an inorganic powder or organic foam filler would act under vacuum conditions, and the Examiner's conclusion that Benson "did foresee and teach that the effects of bending a panel having powder or polymeric foam as the filling material are negligible" is pure speculation and totally unwarranted in view of the different position and condition of these materials in the laminate of Fig. 15 of Benson.

In fact, it was quite surprising that the filler material of the panels which are curved according to the present invention would determine the final shape of the panel. Given the fact that the barrier sheet has a thickness not greater than 100μm, such sheets have negligible

thickness and insufficient strength to determine the panel shape. Moreover, the inorganic powder filler or porous organic foams would not appear to have sufficient thickness or rigidity to determine the final shape of the panel. Yet, it was unexpectedly found that upon evacuation of the panels and curving by calendering, the filler material determined the final shape of the panel.

Applicant wishes to comment on another error of the Examiner in rejecting claim 8, which provides for calendering the planar vacuum panel simultaneously with at least one layer of an adhesive polymeric foam placed on at least one surface of the panel. The Examiner contends in the paragraph bridging pages 5 and 6 of the Office Action that Benson teaches spacer beads coated with a polystyrene or similar adhesive material affixed to the wall sheets of the planar vacuum panel, thus creating at least a layer of polymeric adhesive on at least one surface of the panel. However, this is a misreading of present claim 8 and/or Benson. Thus, a surface of the panel as presently claimed is on the outside of the panel, not on the inside as provided in Benson. The polymeric adhesive of Benson is used to keep the spaced apart beads within the panel. This adhesive layer is not the filler material of Benson and does not serve to space the layers of the envelope apart. If it did fill all of the space between the glass or ceramic beads, there would be no porosities to be evacuated, since an adhesive is typically a continuous material. Therefore, there would be a shorting of the insulation due to thermal conductivity between the two panel faces. In any event, this disclosure of Benson does not teach the type of adhesive layer specified in claim 8.

In sum, there is no motivation in the prior art relied upon by the Examiner to combine the references in the manner proposed by the Examiner, no expectation of success from such a combination, and in fact, there is a teaching away from the invention in the Yamashita reference. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness. Moreover, in several respects, the Examiner's interpretation of the prior art references and/or the present claims is incorrect and does not provide a proper basis for teaching all of the elements of the presently claimed invention. Accordingly, the rejections are improper and should be withdrawn.

In view of the above Remarks, it is submitted that all of the claims presently pending in the application patentably distinguish over the prior art of record. Reconsideration and an early Notice of Allowance are respectfully solicited.

Respectfully submitted,

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Petition for Extension of Time (two months)